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Synthetic profile for sealing gaps especially when repainting vehicles -
has profile joined loosely to adjoining surface using strip with at least
one adhesive coating which is joined to profile in narrow region

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Abstract (Basic): DE 29705114 U

The profile (300) is made from a synthetic material, and is used to
seal a gap, especially when painting bodywork parts (28,30,34) on a
motor vehicle. It has adhesive equipment (10) which allows it to be
fastened to a surface, so that it can also be released.

The equipment is a strip with at least one adhesive coating (14),
which is connected to the profile in a predetermined region (12), which
is smaller than the extension of the strip. The connection between the
strip and the profile may also use an adhesive which cannot be
detached.

ADVANTAGE - Is suitable for sealing all forms of bodywork gap.

Dwg.4/43

¹⁹FEDERAL REPUBLIC OF GERMANY

¹²Utility Model
¹⁰DE 297 05 114 U1

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⁵⁴ Synthetic Material Profile for Gap Sealing

^{*} some of the numbers on the copy of the title page are not clearly legible; please compare to the original

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Title:

Synthetic Material Profile for Gap Sealing

Description

The invention concerns a synthetic material profile for the sealing of gaps, in particular for repair paint jobs on car body parts, with an adhesive for the removable fastening of the synthetic material profile to a surface. The invention further concerns a process for the placing of a corresponding synthetic material profile to seal gaps. The invention further concerns an applicator for a synthetic material profile for gap sealing.

When preparing, for example, a motor vehicle body for a repair paint job, it is usually necessary to cover certain parts or areas, so that these do not come into contact with spray paint during the later painting. A suitable means for this are adhesive strips, synthetic material strips, joint-sealing strips and/or foam strips.

In most cases during repair paint jobs of motor vehicles only a partial area of a motor vehicle body is restored. Such partial restorations make up about 90% [of the jobs] in an automotive paint shop in comparison to 10% of complete motor vehicle paint jobs.

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For this purpose, portions of a motor vehicle must be covered with paper, foil or an accordingly suitable cover material so that only the part to be repaired is painted. The boundaries are almost always in the area of joints. But for that it is necessary that these joints are sealed off against the penetration of paint mist.

It is the object of the present invention to make available an improved synthetic material profile, an improved process and an improved applicator for placing the synthetic material profile of the above mentioned kind.

The means for attaining this object are in a synthetic material profile of the above mentioned kind with the features characterized in claim 1, as well as in a process according to claim 19, as well as in an applicator of the above mentioned kind with the features characterized in claim 21.

For that it is provided according to the invention that the pressure-sensitive adhesive agent is an adhesive strip with at least one first adhesive coating, whereby the adhesive strip is bonded with the synthetic material profile in merely a predetermined area which is smaller than the extent¹ of the adhesive strip.

This has the advantage that such a synthetic material profile can be used universally and is fit for use in practically every joint no matter how [it is] shaped.

Preferable further developments of the synthetic material profile are described in the claims 2 to 18.

The adhesive strip is preferably a paper-masking strip and the synthetic material profile a foam strip or a joint-sealing strip.

For a stable and reliable construction, the bond between the adhesive strip and the synthetic material profile is an undetachable adhesive bond, whereby the bond between the adhesive strip and the synthetic material profile is preferably done by means of an adhesive, the strength of which is higher than the inherent strength of the material of the synthetic material profile.

¹ or *breadth*

The bond between the adhesive strip and the synthetic material profile is preferably a hot-melt adhesive bond.

A particularly effective and versatile construction is achieved in that the adhesive strip is an adhesive paper strip with a first pressure-sensitive adhesive layer and a second pressure-sensitive adhesive layer, whereby the second pressure-sensitive adhesive layer for the fastening to one inner side of a joint is a removable adhesive coating on the adhesive paper strip and the first pressure-sensitive adhesive layer is the bond between the adhesive paper strip and the synthetic material profile.

For a simple transport without the danger of the unintentional adhering of the adhesive coating to a surface prior to the application in a joint to be sealed, the first adhesive coating is covered by means of a removable silicone paper.

The silicone paper has thereby in an advantageous way holes at set distances. These serve as points of adhesion for rolled-up, aligned² synthetic material profiles.

An advantageous, additional covering of areas around the gap to be sealed is achieved in that the adhesive strip projects on at least one side beyond the dimensions of the synthetic material profile.

A simple possibility for a further adhesive bond to a cover material adjacent to the gap to be sealed is achieved in that a second adhesive strip is arranged on the adhesive strip, which [second strip] has a second adhesive coating.

The second adhesive coating is thereby preferably oriented in the direction opposite to the first adhesive coating.

For a safe transport, the second adhesive coating is covered by means of a removable silicone paper.

The silicone paper has thereby in an advantageous way holes at set distances. These serve as points of adhesion for rolled-up, aligned synthetic material profiles.

² e.g., aligned or stacked rolls prepared for packaging or transport

The ratio of the length of the adhesive bond between adhesive strips and synthetic material profile to the length of an adhesive strip is preferably 1:2 to 1:20, in particular 1:7, 1:8 or 1:12.

In a particularly advantageous way, the synthetic material profile has a trapezoidal cross-section or is designed prism-shaped. For special applications, a recess is preferably provided in the synthetic material profile, in which the adhesive strip or the adhesive strips is or are located.

The following steps are provided for according to the invention in a process according to the invention of the above mentioned kind:

- (a) Insertion of the synthetic material profile into a gap to be sealed,
- (b) creation of a pressure-sensitive adhesive bond between the first pressure-sensitive adhesive layer of the adhesive strip and a surface in the gap to be sealed,
- (c) bending the synthetic material profile into the gap into [a] wedged³ sealing position, into a first predetermined direction, and
- (d) bending of one end of the adhesive strip into a second predetermined direction, where the second predetermined direction is oriented opposite to the first predetermined direction.

A complete sealing and covering of desired locations are achieved in an advantageous way through the following, additional step:

- (e) Creation of a bond, in particular an adhesive bond, between the end of the adhesive strip bent in step (d) and additional covering materials.

According to the invention, an applicator for a synthetic material profile for gap sealing is provided, in particular for performing the above mentioned process, with a base plate for guiding the synthetic material profile in the gap to be sealed and a handle part, which is located on a first side of the base plate, whereby a guide blade is further located on the base plate, which encompasses at least in part the synthetic material profile and has a stop as the lateral guide for the synthetic material profile.

³ or *jammed*

This applicator has the advantage that it makes possible an easy and quick fitting of the synthetic material profile.

In order to be able to avoid possible obstacles during the movement of the applicator along a gap to be sealed without having to remove the applicator, the guide blade is mounted to the base plate [so as to be] movable with respect to it.

Usefully, in one direction the guide blade is movable with respect to the base plate essentially perpendicularly to the longitudinal extension of the synthetic material strip.

For a defined guiding, a recess is built into the base plate through which means of fastening take hold of the guide blade, such that the guide plate is movable with respect to the base plate along the recess.

To achieve a continuous guiding in which the synthetic material profile is held and guided on the base plate through the guide blade, a tension element is located on the guide blade which exerts a force on the guide blade in the direction of the synthetic material profile.

It is thereby useful for the tension element to be a spring and to preferably be supported against an abutment on the handle part.

The stop of the guide blade is usefully designed as a plurality of ribs distanced from one another, whereby the ribs run in that portion of the guide blade which partially encompasses the synthetic material profile.

The ribs are preferably oriented parallel to one another and one end of each of the ribs is connected to the guide blade and one opposite end of each forms a stop surface for the synthetic material profile, whereby the latter ends of the ribs form a plurality of discrete stop surfaces parallel to one side of the synthetic material profile.

In a further preferred embodiment, the stop of the guide blade is an L-shaped blade which is parallel to and built against the guide blade. A long leg of the L-shaped blade runs parallel to the base plate and is fastened to the guide blade.

To accommodate a part of the synthetic material profile, for example, a projecting strip of adhesive, a gap is suitably formed between the stop and the guide blade, on a side encompassing the synthetic material profile.

In a particularly preferred embodiment, the guide blade has an L-shaped design, whereby one leg of the L-shaped blade runs parallel to the base plate.

A further support for the application of the synthetic material profile into a gap to be sealed is achieved in that an additional stop is located at the end of the guide blade facing away from the handle part. Preferably, this [stop] extends essentially perpendicular to the base plate, where it particularly extends away from the guide blade in the direction of the base plate or away from the base plate.

For an interruption- and trouble-free guiding of the synthetic material profile in the applicator, an antiblocking coating is formed at least on part of a surface of the guide blade which is facing the synthetic material profile.

Suitably, the handle part has a certain predetermined angle with respect to the base plate.

For the additional guiding of the synthetic material profile on two sides, a second guide blade is arranged on the base plate at an end facing away from the handle piece. This [blade] preferably runs parallel to the stop of the guide blade. It is thereby advantageous if the second guide blade along the end of the base plate is tilted by a predetermined angle with respect to the stop of the guide blade, whereby the second guide blade is tilted towards the synthetic material profile or away from it.

The synthetic material profile to be applied with the applicator is suitably designed according to one of the claims 1 to 18.

In the following, the invention is explained more closely by means of the enclosed drawings. These show in

Fig. 1 a sectional view of a first preferred embodiment of a synthetic material profile according to the invention,

- Fig. 2 a sectional view of a second preferred embodiment of a synthetic material profile according to the invention,
- Fig. 3 a sectional view of a third preferred embodiment of a synthetic material profile according to the invention,
- Fig. 4 a sectional view of an application example of a synthetic material profile according to the invention according to the third example of embodiment from Fig. 3,
- Fig. 5 a sectional view of an application example of a synthetic material profile according to the invention in the gap between a door at the height of the lock and a part of the car body,
- Fig. 6 a sectional view of an application example of a synthetic material profile according to the invention in the gap between a door and a door port⁴ B-pillar,
- Fig. 7 a sectional view of an application example of a synthetic material profile according to the invention in the gap between a door at the height of the middle of the door and a part of the car body,
- Fig. 8 a sectional view of an application example of a synthetic material profile according to the invention in the gap between a door in the area at the side of a rear window⁵ and a part of the car body,
- Fig. 9 a sectional view of an application example of a synthetic material profile according to the invention in the gap between a hood and a fender,
- Fig. 10⁶ a sectional view of an application example of a synthetic material profile according to the invention in the gap between a hood and a fender,

⁴ or *dooe spar*; literal translation of *Türholm*. Not familiar with the particular jargon, but *B-pillar* by itself might be sufficient.

⁵ *Hinterfenster* is normally correctly translated as *rear window*. In this context *rear side window* may be intended.

⁶ sic. same Fig. description as for Fig. 9

- Fig. 11 a sectional view of an application example of a synthetic material profile according to the invention in the gap between a door in the lower area and a floor part of the car body,
- Fig. 12 a sectional view of an application example of a synthetic material profile according to the invention in the gap between a door at the height of the key and a part of the car body,
- Fig. 13 a sectional view of an application example of a synthetic material profile according to the invention in the gap between a door and door port⁷ B-pillar,
- Fig. 14 a sectional view of an application example of a synthetic material profile according to the invention in the gap between a door at the height of the middle of the door and a part of the car body,
- Fig. 15 a sectional view of an application example of a synthetic material profile according to the invention in the gap between a door in the area at the side of a rear window⁸ and a part of the car body,
- Fig. 16 a sectional view of an application example of a synthetic material profile according to the invention in the gap between a hood and a fender,
- Fig. 17 a sectional view of an application example of a synthetic material profile according to the invention in the gap between a hood and a fender,
- Fig. 18 a sectional view of an application example of a synthetic material profile according to the invention in the gap between a door in the lower area and a floor part of the car body,
- Fig. 19 a sectional view of an application example of a synthetic material profile according to the invention in the gap between a door in the area on the side/above the lock and a part of the car body,

⁷ or *door spar*; literal translation of *Türholm*. Not familiar with the particular jargon, but *B-pillar* by itself might be sufficient.

⁸ *Hinterfenster* is normally correctly translated as *rear window*. In this context *rear side window* may be intended.

- Fig. 20 a sectional view of an application example of a synthetic material profile according to the invention in the gap between a door area center/window and a part of the car body,
- Fig. 21 a sectional view of an application example of a synthetic material profile according to the invention in the gap between a door in the upper area and a roof part of the car body,
- Fig. 22 a sectional view of an application example of a synthetic material profile according to the invention in the gap between a door in the upper area and a vertical window pillar⁹
- Fig. 23 a sectional view of an application example of a synthetic material profile according to the invention in the gap between a hood and fender,
- Fig. 24 a sectional view of an application example of a synthetic material profile according to the invention in the gap between a rear hatch in the area on the side and a part of the car body,
- Fig. 25 a sectional view of an application example of a synthetic material profile according to the invention in the gap between a door in the area on the side/above the lock and a part of the car body,
- Fig. 26 a sectional view of an application example of a synthetic material profile according to the invention in the gap between a door area center/window and a part of the car body,
- Fig. 27 a sectional view of an application example of a synthetic material profile according to the invention in the gap between a door in the upper area and a roof part of the car body,
- Fig. 28 a sectional view of an application example of a synthetic material profile according to the invention in the gap between a door in the upper area and a vertical window pillar¹⁰,

- Fig. 29 a sectional view of an application example of a synthetic material profile according to the invention in the gap between a hood and fender,
- Fig. 30 a sectional view of an application example of a synthetic material profile according to the invention in the gap between a rear hatch in the area on the side and a part of the car body,
- Fig. 31 a sectional view of an application example of a synthetic material profile according to the invention in the gap between a door and a part of the car body,
- Fig. 32 a sectional view of an application example of a synthetic material profile according to the invention in the gap between a door and a part of the car body,
- Fig. 33 a top view of a silicone paper, and
- Fig. 34 a sectional view of a further application example of a synthetic material profile according to the invention in the gap between a door and a part of the car body,
- Fig. 35 to 38
further preferred examples of embodiment for a synthetic material profile in a sectional view
- Fig. 39 a first preferred example of embodiment of an applicator according to the invention in sectional view,
- Fig. 40 in top view,
- Fig. 41 a second preferred example of embodiment of an applicator according to the invention in sectional view,
- Fig. 42 in top view, and

⁹ possibly *C-pillar*

¹⁰ possibly *C-pillar*

Fig. 43 a sectional view of a further application example of a synthetic material profile according to the invention in the gap between a door and a strip¹¹ of the car body.

Fig. 1 shows a first preferred embodiment of a synthetic material strip 100 according to the invention. This [strip] has a rectangular foam profile 16 and an adhesive paper strip 10. The adhesive paper strip 10 further comprises a first pressure-sensitive adhesive layer 12 for bonding the adhesive paper strip 10 to the foam profile 16 and a second pressure-sensitive layer 14 for the creation of a removable adhesive bond to a surface. To protect [it] from an unintentional premature adhering, for example, during transport, the second pressure-sensitive adhesive layer 14 is preferably covered with a silicone paper 18. The adhesive strip 10 extends essentially over the entire length of the foam profile 16. The adhesive bond 12 between the adhesive strip 10 and the foam profile 16 is designed [to be] only very short in relation to the length of the adhesive strip 10. With that one achieves at least one long free end 20 which can be used, as described in the following, to cover the surrounding [area] of the gap.

Fig. 2 shows a second preferred embodiment of a synthetic material profile 200 according to the invention. This [profile] basically corresponds to the first embodiment from Fig. 1, but where the free end 20 is lengthened such that it projects beyond the dimensions of the foam profile 16.

Fig. 3 shows a third preferred embodiment of a synthetic material profile 300 according to the invention. This basically corresponds to the second embodiment from Fig. 2, but where in addition, a second adhesive strip 22 is arranged on the projecting end 20 of the first adhesive strip. This second adhesive strip 22 has a second pressure-sensitive adhesive layer 24 which is oriented in the opposite direction from the pressure-sensitive adhesive layer 14. For transport and processing purposes, this second pressure-sensitive adhesive layer 24 may also be covered with a silicone paper 18 of appropriate dimensions.

The mode of operation of the synthetic material profile for gap sealing is represented schematically in Fig. 4 by means of the embodiment 300. The sealing strip 300 is inserted

¹¹ sic. *part* might have been intended

into a gap 26 to be sealed and fastened by means of the pressure-sensitive adhesive layer 14 to the car body part 28. The opposite end 32 of the foam profile 16 is bent over such that the synthetic material profile seals the gap 26 [by being] wedged in. The position of the foam profile 16 prior to the end 32 being bent over is indicated by dashed lines.

Due to the only small pressure-sensitive adhesive bond 12 between [the] foam profile 16 and [the] adhesive strip 10, the latter essentially remains standing in [an] upright position and the end 20 with the second adhesive strip 22 projects out of the gap 26. In a further processing step, this projecting [part] 10, 22 is now bent in the opposite direction than the end 32 of the foam profile 16 such that it lies against the surface of the car body part 28. In this position, the strips 10 and 22 cover an area of the car body part outside of the gap 26. A further covering takes now place by means of a cover foil, paper or another suitable means for covering 34.

By bending over the projecting [part] 10, 22 in the direction of the arrow 36, the second pressure-sensitive adhesive layer 24 lies now on the car body part 28 facing upwards such that by placing the means for covering 34 on the second adhesive strip 22, a pressure-sensitive adhesive bond is formed between the means of covering 34 and the adhesive strip 22. The cover now runs seamlessly from the outer surface of the car body part 28 up into the inside of the gap 26.

The synthetic material strip¹² according to the invention thus distinguishes itself in that after its application it already covers a partial area of a car body or a part to be covered, such that the remaining surface can be covered in an easy way without a large work effort.

Such a combination strip brings a considerable saving in labor for the user. The synthetic material profile as such is always bent over to the one side and leads to an overall sealing of the gap 26, whereas the adhesive paper strip 10 is bent over to the other side and by that covers already approx. 1 cm or more of the surface to be covered [on the] outside of the gap 26.

¹² sic.

The bond between [the] foam and [the] adhesive paper strip preferably takes place by an adhesive, e.g., hot melt, which creates a strong bond to the foam and to the back side of the adhesive strip. An adhesive is used for this which preferably lies in its strength above the inherent strength of the foam.

The Fig. 5 through 30 illustrate further application examples of a synthetic material profile 100, 200 or 300 according to the invention in a gap 26, each between a door 30 and a car body part 28 or between a hood 38 and a car body part 28 or between other car body parts 28. Thereby, the sealing strip in the Fig. 5 to 11 is inserted each time the other way around than in the Fig. 12 to 18. The same is valid for the Fig. 19 to 24 in relation to the Fig. 25 to 30. Appropriate arrows 40 indicated in each [case] the movability of car body parts 28, 30 or 38.

Additionally designated in Fig. 28 with 101 is the state of the synthetic material profile 200 after the first step, namely the insertion. The reference number 102 designates the state of the synthetic material profile 200 after step two, i.e., after pressing the synthetic material profile 200 into the gap 26. In the Fig. 5 to 27 and 29 to 30, these corresponding states are also illustrate, without additionally providing each of these with reference numbers.

Fig. 34 shows a further advantageous embodiment of a synthetic material profile 400. Hereby, the adhesive strip 10 is located in a recess 44 of the synthetic material profile. This embodiment is suitable in particular for complete paint jobs, as described more closely in the following.

Fig. 31 to 33 show different methods of installing a synthetic material profile 200 or 400 for different paint job situations.

Represented in Fig. 31 is a paint job situation in which an area 46 of the car body part 28 is to be repainted, while the door 30 is suitably covered with a foil or a paper 34. When installing the synthetic material profile 200, it is at first inserted into the position A and achieves a pressure-sensitive adhesive bond, for example, with the door 30. The adhesive strip 10 is subsequently bent over according to the arrow 36 such that its adhesive layer 14 lies against the means of covering 34 and adheres there. Finally, the foam

profile 16 is pressed into position B into the gap 26. The door 30 and the gap 26 are now sufficiently protected from the paint, and the corresponding car body part 28 can be repainted.

Fig. 32 shows a similar situation as in Fig. 31, but in this case the car body part 28 is to be covered and the door 30 to be repainted. The synthetic material profile 200 is appropriately inserted the other way around into the gap 26 into the position A and B, as explained above for Fig. 31, such that the car body part 28 and the gap 26 are protected from [the] paint to be applied. This shows the special advantage of the synthetic material profile according to the invention, namely that [the] same shapes of synthetic material can always be used independently of which area next to the gap is to be repainted, whereby merely the orientation of the synthetic material profile in the gap must be chosen accordingly.

Fig. 33 exemplarily shows a silicone strip 18 which has holes 42 at set distances, e.g., 100 mm to 200 mm. By means of these holes, row-like arrangements of synthetic material profiles 100, 200, 300, 400 or 500 may be rolled up, whereby a weak adhesion is possible in the rolls through these holes 42, such that the rolls remain stable [when] rolled up until they are unwound with [the] appropriate action of manual force.

Fig. 34 shows a painting situation analogous to Fig. 32, i.e., the car body is covered and the door 30 is to be painted in the area 46. Represented is a further advantageous embodiment of a synthetic material profile 500. This [profile] is designed V-shaped or else has a trapezoidal cross-section. The adhesive strip 10 may thereby be also laminated.

To sum up, the following process flow thus results from the previous and in particular from Fig. 43 for the application of a synthetic material profile in a gap to be sealed:

The flat foam strip is placed on the car body such that the crêped paper bonded to the flat strip projects vertically outwards by approx. 10 mm. The further means of covering 34, for example, PE-foil or cover paper ¹³, is placed on the car body 28 such that the end of this foil abuts perpendicularly against the projecting crêpe paper. This crêpe paper is then folded over and adheres to the foil 34. Through that, the foam strip 16 is applied in one

¹³ possibly *release paper*

work step as well as the corresponding side being covered entirely in order to prevent the impingement with paint mist. The foam strip 16 is then pressed into the gap 26 so that the gap is entirely closed.

Fig. 35 to 38 show further preferred embodiment of synthetic material profiles 600, 700, 800, and 900 of various cross-sections, like parallelepiped-shaped (Fig. 35), T-shaped (Fig. 36) or trapezoidal (Fig. 37 and 38).

Inferred by Fig. 39 to 41 are two preferred embodiment for an applicator 1000 and 1100. A handle part 52 is attached at an angle to a base plate 50. A guide blade 54 is provided on the base plate 50, which is essentially built in an L-shape, whereby the long leg runs approximately parallel to the base plate 50 and the short leg approximately perpendicularly. An extension piece 56 is provided on the short leg by means of which the guide blade 54 is connected to the base plate 50. An additional stop 58 is further provided on the guide plate 50. In the represented embodiment 1000 and 1100, the stop 58, the guide blade 54 and the extension piece 52¹⁴ are shaped through bending from one [piece of] sheet metal. But the parts of the applicator may also be cast from synthetic material.

An additional stop 60 is further provided on the base plate. This one is designed [to be] flexible as indicated in Figure 41 by means of dashed lines. The additional stop 60 is made, for example, of rubber. A recess 62 is further formed on the base plate, through which means of fastening 64 grip into the guide blade 54 or its extension piece. In this way, the guide blade 54 is designed shiftable with respect to the base plate. The guide blade has a force being exerted on it by a spring 72, whereby the spring 72 rests against an abutment 74 on the handle part 52. The guide blade 54 is shiftable, for example, by about 16 mm against the elastic force. In this way, when placing a synthetic material strip into a gap 26 to be sealed, obstacles can be overcome without having to remove the applicator 1000, 1100 from the gap. For that, the guide blade 54 must simply be moved backwards. Molding parts or synthetic material reinforcements on the floor side are such projecting parts. The pulling back of the guide blade 54 is thereby done manually, where then, the spring 72 automatically brings the guide blade 72 again into its initial position.

¹⁴ sic.

A stop 66 is further provided in the guide blade. The stop 66, guide blade 54, base plate 50 and additional stop 60 thus form a guide for a synthetic material profile 68. Hereby, the long leg of the L-shaped guide blade 54 encompasses the synthetic material strip 68 for a secure guiding and thus prevents the synthetic material profile 68 from sliding out.

The difference between the examples of embodiment 1000 from Fig. 39 and 40 and the examples of embodiment 1100 from Fig. 41 and 42 consists essentially in the design of the stop 66. This [stop] is designed once as a single rib 66A (cf. Fig. 39 and 40) and once as a continuous, L-shaped blade 66B.

A projecting part of the adhesive strip 10 is held in the gap 70 between the guide blade 54 and the stop 66. With this applicator 1000 and 1100 it is possible to apply flat strips 68 with [a] laterally projecting section on the side of the car body as well as on the side of the door.

For an adhesion-free guiding of the synthetic material strip 68 in the guide blade 54, the latter is provided with an antiblocking coating 76 on its surfaces facing the synthetic material strip. This is, for example, an adhesively bonded metal strip with antiblocking coating.